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ABSTRACT

Characteristics of users of electronic bulletin boards, the perceived impact that bulletin boards have on users, and how their use affects the use of other communications media were studied using a random sample of users of CompuServe and Prodigy, two major bulletin board services. Respondents (95 for CompuServe and 78 for Prodigy) were interviewed asynchronously on-line through electronic mail. Results of the on-line survey support adoption hypotheses that suggest that bulletin board users are more highly educated and more wealthy, and work in more prestigious occupations than does the average American. A similar lower-age hypothesis was rejected. Open-ended responses to the question "Why use boards?" were content analyzed. Hypotheses suggesting a reduction of consumption of the media television, books, telephone use, and personal letter writing were supported. Rejected were lower magazine reading, face-to-face conversations, and other on-line communication. Findings also show significant differences in the CompuServe and Prodigy systems along several of the variables mentioned above, in addition to amount of use, message rate, and family usage patterns. Seven tables present study findings. (Contains 54 references.) (SLD)

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AN EXPLORATORY STUDY OF THE PERCEIVED BENEFITS OF ELECTRONIC BULLETIN BOARD USE AND THEIR IMPACT ON OTHER COMMUNICATION ACTIVITIES

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AN EXPLORATORY STUDY OF THE PERCEIVED BENEFITS OF ELECTRONIC BULLETIN BOARD USE AND THEIR IMPACT ON OTHER COMMUNICATION ACTIVITIES

Abstract

Electronic bulletin boards have become more popular with the advent of low cost computers, easily available communication channels, and large network systems. With its public posting of messages, relatively large audiences can read and provide immediate feedback. Network organization provides a hierarchical system to give users access to thousands with like interests across the country, or even the world.

A random sample of bulletin board users was selected from the two major national bulletin board services, CompuServe® and Prodigy®, and interviewed asynchronously, on-line, using electronic mail.

This study characterized this bulletin board audience focusing on the issues of 1) adoption-- what characteristics bulletin board users possess, and 2) social impacts-- how bulletin board adoption affects the use of other communication media.

Results of the on-line survey supported adoption hypotheses suggesting bulletin board users are higher educated, more wealthy, and work in more prestigious occupations the average American. Rejected was a similar lower age hypothesis. Open-ended responses to the question "why use boards?" were content analyzed, with selections made to categories in five areas showing a typology of use for this medium. Hypotheses suggesting a reduction of consumption of the media television, books, telephone use, and personal letter writing were supported. Rejected were suggestions of lower magazine reading, face-to-face conversations, and other on-line communication.

The findings also showed significant differences in the CompuServe and Prodigy systems along several of the above variables, in addition to quantity of use, message rate, and family usage patterns.

REVIEW OF RELATED LITERATURE

National On-line Services

On-line communication is so new that few general communication texts even mention its existence. Often put under the broad umbrella of new communication technology (Rogers, 1986), it is given scant attention when compared to other major media. Most general communication texts, such as those by Hiebert, Ungurait & Bohn (1988) and Gamble & Gamble (1989) cover the topic with just a few paragraphs. Both of these put on-line communication in the "videotext" category, a technology they describe as the transmission of information to a television screen. Videotext, in this description, has had very poor reception by the American audience and has failed miserably in market tests, even though funded by major telecommunication giants.

CompuServe, owned by H&R Block, is the oldest service and has about 992,000 members in the United States (July, 1992, data). GEnie followed and has enlisted about 600,000 subscribers. Like CompuServe, it is a text based system, but offers lower-cost bulletin board usage without a per-hour time charge.

Prodigy has only been released nationally since September, 1990, but now has the largest national "recreational" service (Venditto, 1989) in the United States with more than 1.3 million subscribers. Prodigy is owned jointly by Sears and IBM. CBS was a participant in the initial venture also, but dropped out in 1986 (Rothfeder & Lewyn, 1990). Only France's Minitel is larger, but it is a government-owned service distributed free by the government (Rothfeder, et al., 1990).

America On-line is the newest entry with about 300,000 members. Most of its users welcome the company-supplied software that allows easy navigation through the system with icons and a menu base that is familiar to graphic-user-interface system owners such as MacIntosh® and Windows®.

The proliferation of these services has been accelerated not only because of brisk marketing techniques of the vendors, but also because users, as an active audience, seek them as a communication outlet (Swift, 1989). These companies all compete for a larger share of the market of 10 million modem-equipped computer homes in the United States (Flanagan, 1990).

Comparisons of the major services can be seen in many areas that are not related to bulletin board applications. Those areas that relate directly to bulletin selection are cost comparisons, screen

comparisons, system navigation, audience positioning and related communication services. These are covered in more detail below.

Cost comparisons. Dating from the late 1970's, CompuServe is the oldest such service, and, until recently, saw market dominance with a variable cost per minute access fee, depending on the service and speed chosen. The flat-rate marketing methods of GEnie and Prodigy have been appealing to users who could use their "boards" on an unlimited basis (for the basic service and a limited number of messages per month) for $7.95 and $12.95 per month, respectively (Zimmerman, 1990). The newest service, America On-line, also has a flat rate ($5.95/month), but adds a surcharge for services not on their "basic" tier, including general interest bulletin boards. CompuServe began a flat rate method for basic services in March, 1992, but it, too, adds the bulletin board surcharge, which adds an additional $6 or $12.50 per hour for 300 and 1200 baud rates, respectively. For users who report many hours of participation per week, the amount could become large.

To enable this low cost, on-line access for its customers, Prodigy uses 3-line ads at the bottom of the screen to pay most of its cost (Rubenking, 1988). Flanagan (1990) says Prodigy has 200 advertisers, each paying $10-80 thousand per year for the privilege of these cyclical advertisements. Rothfeder (1990) notes that the advertisers pay commission as well. This is possible with the interactive, point of purchase advertisements that allow instant feedback. The advertisements can be individually targeted to specific user types. The ads can also be programmed for those using certain activities on the service. For example, users who choose stock and bond trading services will see advertisements chosen to fit this group well, as compared to those using travel services. These give Prodigy commissions of $40 per month for each 1000 subscribers who call up electronic ads (Rothfeder, 1990).

Screen presentation. Probably the most visible difference between Prodigy and CompuServe is the screen appearance because they have a different method of data presentation. Prodigy is based on a "picture" representation of screen views, some of which are filed inside the user's computer storage. This is based on the North American Presentation Level Protocol Standard (NAPLPS). Each of the screens is described in NAPLPS, interpreted by the software, and then displayed on the monitor with a decoder program (Prodigy Handbook, 1990a).

As in most other draw-type applications, more digital information is required for pictures than for text. There is a definite trade-off for this colorful display in the form of relatively slow retrieval times. Those familiar with text-only displays, such as CompuServe, GEnie, and America On-line may be disappointed with the time delays (Flanagan, 1990; Rothfeder, et al., 1990), with Zachman portraying it as "dismally slow" (1990, p. 76). Unless time is a prime consideration, such as in a business environment, however, many think the view is worth waiting for (Rubenking, 1988).

System navigation. CompuServe, with typical modem software, requires knowledge of the system before navigation is easily performed and inputs data with typed commands. Movement to different areas are made by prefacing the area with the GO! command. To go to the Macintosh Hypermedia Forum, for example, the user types in the command "GO MACHYPER." Proprietary software, such as TAPCIS for IBM compatibles, Navigator, and CIM (CompuServe Information Manager) for MacIntosh Systems, are available at extra cost (about $80 each at manufacturer's suggested prices). They offer menu screens, icon displays, and automation routines that significantly speed data acquisition and aid simplicity of use.

Schwartz (1991) says Prodigy is by far the easiest to operate. Choices, made with a mouse-click or keyboard entries, allow the user to visibly go within hierarchical channels. System software that accompanies the start-up package presents screen graphics with buttons for menu choices and "jump" commands.

Audience positioning. Prodigy paints itself as a family service, and has instituted certain features and rules of operation that encourage the participation from impressionable family members. In an article by Zimmerman, (1991) Prodigy president (at that time) Ted Papes presented the service as family-oriented, and said the company does not allow libelous, obscene, or commercial statements for messages. Venditto (1989) also categorizes Prodigy as strong in family background, while characterizing CompuServe as business-oriented.

Electronic Bulletin Boards

Bulletin boards, collectively, are just one extension of the information gathering ability of the computer/modem tandem, and commercialized databases have accelerated their growth. The major national bulletin boards are growing rapidly. These bulletin boards have become a way of life for many enthusiasts (Edighoffer, 1986; Garramone, 1986; Mihalo, 1985). A cursory view of the

medium suggest that the potential reasons for their choice are: 1) a large potential audience; 2) fast sending and retrieving of messages; 3) nearly transparent "posting" of messages (weak gatekeeper functions); 4) large variety of special interest groups available; and 5) relatively low cost (variable, depending on service). But questions remain about other possible uses and how bulletin boards affect their use of this medium as it supplants, complements, or augments other media.

Using the metaphor of a "real" bulletin board is close to the functional description of electronic bulletin boards. Messages can be "posted" (although a gatekeeper actually allows the message to be visible to the rest of the audience) by one person and viewable by any member of the group. These members gather, asynchronously, to read, consider, and possibly post replies. The messages are placed in order (not unlike sections of a bulletin board organized by its owner) of subject matter and are removed when the quantity overloads the system. The removal rate depends on the board and the service, but the message will always be present for several days. Additionally, and to the chagrin of some messagers, the system operator maintains a certain decorum or group moré that controls message content.

Board organization--CompuServe. The boards are hierarchically organized in defined groups of special interest designated as "forums". In CompuServe they often can be reached through several avenues with different forum areas. For example, the menu routine is divided into 12 major groups, but access can be hierarchically gained for many through several avenues. The Aviation Model Forum (MODELNET) is under the major category of Aviation Forums, and also under Hobbies/Lifestyles/Health Forums. Many such duplications exist in each area.

CompuServe users experienced with CIM, Navigator, TAPCIS, or other communication software have pre-selected routes of preference which speed "travel" through the system--important because time elapsed is directly proportional to money spent. With these (and even basic "free" software, keywords prefaced by the word "GO" takes the user directly to the bulletin board (or forum, as designated by CompuServe) of special interested desired. Each of the forums may be joined by any member with no cost, other than service time charges depending on selected baud rate.

Users who don't choose to "join" or add their names to the member list are automatically locked out of certain options to members, such as reading board messages or adding messages. This author searched through each area and joined every forum found. The number of forums joined for

this study was 254, including the National Bulletin Board, which offers a listing of items for sale, items wanted, or notices to post. During the two-month period of search for this study, three new boards were added.

After joining, menu-driven choices allow conference, library or messaging service options. Conference is chosen for synchronous, on-line communication. Library options are used for downloading programs or information in batch modes.

For the messaging or bulletin board function, users are shown a listing of subject areas within the forum showing title, number of subjects and number of messages that are within. For example the Education Forums grouping (second of twelve) lists 11 selections of interest that may be chosen, as shown below (example from CompuServe output, April, 1992):

II. Education Forums
Computer Training Forum
Disabilities Forum
Education Forum
Educational Research Forum
Foreign Language Forum
IBM/Special Needs Forum
LOGO Forum
Science/Math Education Forum
Space Forum
Astronomy Forum
Students' Forum

Further choice is presented after a specific forum has been chosen and joined. Similarly, the Broadcast Professionals Forum is one of many under the major heading of professional forums. Further, it is divided into 17 areas of specialized interest which may be selected without going "through" other areas. The number of subjects and messages for each area is shown parenthetically (example from CompuServe output, April, 1992):

IX Professional Forums
Broadcast Professionals Forum +
1 General Forum Info. (23/79)
2 Television (21/72)
3 CATV/MMDS (6/38)
4 B.Eng.- Contract (6/16)
5 Radio/TV Talent (23/213)
6 Strictly AUDIO (3/16)
7 Societies (2/3)
8 Post prod. & Prog (3/3)
9 FCC Q & A (2/15)
10 Radio (14/134)
11 Classified, Jobs (10/15)

12 Manufacturers (1/1)
13 Technical Theatre (4/5)
14 The Lobby (4/8)
15 TEK- OnLine (2/3)
16 Cellular/LMR (5/34)
17 Ind.-Edu.-Corp. TV (2/5)

Specialty of interest areas become clear as a further menu choice is available within the subject area. Area #2, Television, for example, further shows that 21 subjects are currently represented in the area as presented by 72 separate messages. When selected, these subjects are shown as below, with the number of messages available for reading in each shown parenthetically (example from CompuServe output, April, 1992):

2 Television (21/72)
1 Public Broadcasting (1)
2 NBC D-3 problem (3)
3 Steadicam EFT (3)
4 improvement to BVW300/400 (2)
5 DCM computer system??? (2)
6 Pick specific still frm. (3)
7 budding producers: Hi8? (6)
8 BUCHANAN IN GOV'T IMPORT (7)
9 tv shows (18)
10 Academy Leader (7)
11 digital TV, mail booboo (3)
12 Hi8 Feature/1ST cut/WOW! (1)
13 Satellite Scrooges (1)
14 Satellite Scrooges (1)
15 Satellite Scrooges (2)
16 Betacam Pro. series (5)
17 S-VHS EDITING (3)
18 Matrox PC stuff? (1)
19 Used the tape (1)
20 Prompter Pgms. (1)
21 Monitor Synch Box? (1)

Experienced users, therefore, can easily choose to view messages depending on interest area without wasting time even within major subject areas. The three messages that may be selected about super-VHS editing (section 17, above) are much easier to find than reading the thousands of messages posted each day.

Alternatively, the user may choose to view subjects by message number (assigned by time/date of posting) rather than by subject. If so, selections for reading may be made for those "after" a certain date. Messages of interest known by a particular number may also be selected individually in CompuServe.

Finally, the user can also choose to read only messages that may be written only to him/her.

Board organization--Prodigy. Prodigy divides the bulletin board access menu into eight major topic areas (called "clubs") that allow linear data acquisition from chosen experts in the field as well as bulletin board selection.

Each of the boards is in self-describing titles, but a help selection to the right of each shows more about its potential. "The Club" (#7) is available only to children under 18, with educational exercises, experiment stations, interactive storybooks, and of course, bulletin boards. This study does not include "The Club" because of the perceived inability of the young children to answer the open ended questions to the depth required. As with CompuServe, however, the Prodigy members who accessed any of the other "adult" boards were accepted as part of the population under study.

The "closeup" board, is a politically-oriented message posting center with subjects that change frequently. The Gulf War, the Presidential Election Race and Capital Punishment are but a few of the timely subjects for comment. Another Prodigy board, "Ask Prodigy," was also not included as it seeks only information about problems and uses of the service.

Within each board, as in CompuServe, users must select a subject area for further narrowing of message selection. Within the homelife board, for example, the user is faced with two "pages" of selections.

Similar to CompuServe, further detail can be achieved, but the quantity of message division with Prodigy is much greater. With Prodigy, the title of the subject is selected by the user and subjects available within a sub-category may number in the hundreds. To eliminate page turning to see specific subjects that are alphabetically arranged, the user may select a 1-4 letter selection which moves the finder to the corresponding "page" of subjects. Alternately, a "date ordered" selection may be made as with CompuServe. In both services, the personal selection possibilities of subject matter are boundless and fragment the interest areas of the system into thousands of categories.

As with CompuServe, Prodigy allows readers to view only messages that are addressed to her/him. Prodigy adds a convenience of seeing messages to or from any selected member.

Message Mechanics. CompuServe limits message lengths to 2000 characters and Prodigy members have 4-5 pages, depending on the message board chosen. Each Prodigy "page" has 20 lines with 40 characters per line possible. Most messages are less than one page long, with messages

rarely extending to the maximum length. The messages may be sent at any hour, but the actual "posting" depends on the board. Message sending on both services is free, after payment of monthly membership fees and on-line CompuServe charges.

Message Supervision/Administration. CompuServe boards are administered by a system operator (sysop) and his/her assistants. They police the boards for improper conduct (see section below) and post the messages in the proper section. They also are frequent writers/responders on the boards and are considered 'experts' in that area. Bowen & Peyton (1989) say they are not employees, but are independent workers who are paid a share of the connect time fees of other users.

Prodigy has no "visible" board leader. Each board is managed by a person employed by the service who makes specific rules regarding conduct and posts the message only after a screening process. The message posting is within a few hours, in most cases.

Message Rules. Before joining the Prodigy Service and most CompuServe forums, members must agree to abide by certain membership stipulations. For bulletin boards, generally, they require the user to not engage in commercial services with the medium, to refrain from slanderous remarks about other members, and to eliminate profanity from postings. The degree to which these standards are maintained depends on the gatekeeper. The gatekeepers are the individual sysops for CompuServe and board managers for Prodigy. Each of the Prodigy gatekeepers, however, appear to have the same standards as shown by similar guidance remarks in each section.

These rules have come under severe criticism in some cases, particularly with Prodigy. Zimmerman (1991) reports that Prodigy regularly censors messages, but the company's vice-president, Henry Heilbrunn, notes that the messages are not edited, but are returned to allow the sender to choose more appropriate wording. Prodigy, according to Heilbrunn, is a family-oriented service, and does not put up libel or obscene or commercial statements for public messages. Zachman (1990) also complains that Prodigy is not being responsible because it disallows certain messages on its public bulletin boards. The author sees this as driving away its customers because freedom of expression is a desirable consumer good.

The development of interactive home systems of any kind make the users vulnerable to threats of privacy, whether potential or real. Wegner (1985) notes that possible problems are accession of stored data files, surveillance/interception during transmission and delivery to unauthorized parties.

Though several technical and legal safeguards exist, new technologies have grown faster than the laws and technologies that protect their users. Prodigy has been faced with a legal battle which was successfully defended (Burke, 1991). Critics had charged that the service downloaded user files from their computers. With Prodigy's insistence on non-posting of messages deemed offensive by their operators, they have been chastised by some as not allowing First Amendment freedoms.

Related communication services. Of the four major services, Prodigy is the only one that does not have interactive modes or library retrieval options (Schwartz, 1991). Prodigy also does not offer value-added sophisticated services that are available from CompuServe such as Dialog® and the Executive News Service® (Flanagan, 1990). With these added services, of course, comes added prices that are in addition to the regular connect time.

Application to Selected General Communication Theories

Previous discussions about the characteristics of computer-mediated communication, when compared to the mass media and interpersonal communication systems, reveal many similarities and differences that have indistinct boundaries. These blur the possible cross applications of theory (Cathcart, et al., 1985; Rogers, 1986; Rogers, et al., 1985) making theories that were specifically heuristic in the mass or interpersonal fields of questionable use when studying computer-mediated communication.

Many general communication models may be applicable, however. The basic communication models and paradigms of Schramm (1955) and Shannon & Weaver (1949) exhibit face validity to the examination of bulletin board patterns of communication behaviors as an organizing structure. But even these have been criticized.

Rogers and Kincaid (1981) spurn the idea of following linear models that describe effects of one-way media as an application for the technologies that clearly are interactive with a different assumption of feedback. They propose that this interactive quality mandates the study as a convergence model described as the mutual process of information transfer between participants in a system. This would eliminate the view of sender and receiver found in the Shannon & Weaver model, and replace the constructs with "participant."

Cautions for Research with the "New" Media

Pool (1983) says that when a medium is in the early stages of development, predictions are usually inaccurate at best, and may be unknown. Rogers (1986) found that the characteristics of persons with early adoption of a new technology may be vastly different than those found in the "take-off" stage or those considered to be later adopters .

Of necessity, bulletin board users in this relatively early stage are thought to be relatively privileged, socioeconomically and educationally. Rothfeder (1990) presupposes the Prodigy market as very upscale. Indeed, a recent demographic report on Prodigy (1990b) shows that 65% have college degrees, 67% work as a professional or in management, and have a median income of $73,000 per year (as compared to $32,100 for the national average.)

Though not dealing directly with electronic bulletin boards, Dutton, Rogers, & Jun (1987) analyzed the impact of general computer use found through a meta-analysis of eleven studies. Since computer usage is a prerequisite for bulletin board activity, the results should be transferable to a high degree. These researchers found that use of computers is predicted accurately by socioeconomic status, and that formal education is more highly correlated to its use than any other variable. These researchers were concerned with the disparity between those on each end of this socioeconomic continuum, but suggested that the relationship of status to adoption will decline as the price of personal computers declines. Though information may become a valuable commodity across all economy, occupational and education spectra, the field probably is relatively isolated to the "haves."

Rogers (1986, p. 133) further explained this as due to three factors:

1. New technologies are a luxury item, and the socioeconomic elites can more readily afford this item from their disposable income.
2. Those with higher education levels may be more aware of the importance of information, and thus be more willing to pay for it.
3. Those with some occupations considered higher in prestige value (scientists, professors, engineers, for example) may be more technically competent with associated equipment, and less "computer-phobic" in approaching new media technologies.

Further, Roger's research concludes that younger persons are less timid in experimenting with and adopting new media patterns. The time-line shown above indicates some media have a "take-off"

earlier in the cycle than others. Rogers predicts that this point occurs in the 10-25% adoption stage (gray oval area). This area is difficult to detect for bulletin board usage. Though major on-line services have captured at least 20% of the market of modem-equipped computer homes, it cannot be necessarily concluded that bulletin board usage is at the same level. The number of message postings is much lower, but adding those who just "browse," "lurk" or "scan" the boards should elevate it significantly.

In a study of three CompuServe bulletin boards, Blackman (1990) discovered that only 9% of those callers who had message posting capability actually posted messages on the boards. He concluded that most people who visit and read the messages do not post them. For these reasons, it is unclear that bulletin board users would fit the mold of early adopters that Rogers proposes. This study will capture some of the socioeconomic indicators for later correlation.

User Benefits

IBM chairman John Akers says, "In the final analysis, what this thing (Prodigy) has to do is change people's habits . . . Today, the storage of data is 95% paper and 5% electronic." (Chakravarty & McGlinn, 1989).

Akers is aware, from a marketing view, that the way Americans will access data in the future will be vastly different. But before users can be sold on an idea, service, or even a communication method (such as bulletin board usage), they must be convinced that they will benefit in its use.

What are the benefits to electronic bulletin board usage? In a study of three CompuServe forums, Blackman (1990) found that messages engage in at least three distinct types of strategies.

Information exchange was shown in the study as those communication messages that centered around a question or an appeal for help. From a categorical point of view, these could be further broken down into many divisions, of course, such as questioning, answering, clarifying, and gratitude remarks for information exchange.

The third category found by Blackman was the on-line conversation. He differentiates this from information exchange in that the first questions are "more open-ended and often called explicitly or implicitly for discussion." (p. 240).

Concluding his work with a call for future research areas, Blackman says,

"Since the results of this study have relied upon unobtrusive methods and understanding the culture of computer-mediated communication users requires investigation of how users perceive their behavior and culture, the logical next step is to begin to collect information from users about their on-line experiences."

Continuing, his first suggestion is:

> "Through interviews and survey methods the users should be queried on how they perceive their behavior on-line. What messaging do they do? How often? How do they juggle the . . . messaging activities . . . with their information objectives?" (p. 264)

Summary of Literature Review and Rationale for Study

This new medium calls for a different analysis method. An analysis of the five major characteristics that define computer-mediated communication -- interactivity, asynchronicity, channel segmentation, mechanomorphism, and lack of sensory data --indicates that research in this area must take some new direction. Rogers (1986) concludes that these differences makes it almost impossible to investigate the effects of a new communication system using past research that relied on the linear effects paradigm, where:

> "a relatively standardized content of the media could be assumed (at least to the extent that the same messages were available to everyone in the audience.) With the new media, message content becomes a variable; each individual may receive quite different information from the interactive communication system . . . Conventional research methodologies and the traditional models of human communication are inadequate. That's why the new communication technologies represent a new ball game for communication research." (p. 7).

Though much background has been given for the importance of computers, software, and hardware, the author does not propose that technology is the major cause for the communication changes that have been described. This, as a technological deterministic view, would attribute the fundamental changes of human communication entirely to the new information technologies, particularly computers.

Rather, this author agrees with Rogers (1986) that importance should be placed on the way in which individuals use the new technologies. From a behavioral approach, we need to focus on two major issues -- adoption and social impacts. The research questions/hypotheses focus on these areas.

Research Questions for Consideration

Adoption. In the context of this study of bulletin board usage, this issue asks of bulletin board services:

1. Who chooses to use bulletin boards?

Previous research would predict that new technologies that are computer-related would be adopted more quickly by persons in certain groups. Four one-tailed hypotheses are presented, proposing that bulletin board users, as compared to the universe of American adults are:

H_1. More highly educated.

H_2. Wealthier.

H_3. Work in more prestigious occupations.

H_4. Younger.

2. What differences in demographics are apparent across the two major services?

A pattern is expected to become emerge during categorization of this data.

3. What differences in demographics appear between the bulletin board users of Prodigy and the general Prodigy service users?

The Prodigy bulletin board data will be compared to a Simmons Survey (1990) on the entire population of Prodigy subscribers. Though the survey include only the "A" (bill paying) subscribers, and not spouses or children, data will be compared for analysis.

Social impacts. Research questions related to this issue are:

4. Why do subscribers choose to use bulletin boards? What benefits of bulletin board usage can be detected according to the preferences and purposes of those who use these services?

A typology of bulletin board benefits will emerge from a content analysis of the users' responses. From previous research, the broad areas would include information exchange, conversation, and information viewing. From pilot study data, it is predicted that specialized areas of entertainment, business, and information gathering will emerge as sub-categories.

5. How does bulletin board usage affect the older technologies of communication? What communication activities are supplanted, complemented or augmented, if any?

Communication activities will be changed with the addition of another medium. Because the major uses of bulletin boards in previous studies involved home-based, non-business, information seeking (communication activities) or information perusal (entertainment) activities, it is hypothesized that, because of bulletin board activity, the following communication activities will decrease:

H_5. Television viewing.

H_6. Book reading.

H_7. Magazine reading.

H_8. Telephone talking.

H_9. Letter writing.

H_{10}. Face-to-face conversations.

H_{11}. Other on-line communication.

Because the following are primarily out-of-home activities, It is hypothesized that bulletin board usage will have no effect on the consumption of the following communication activities:

H_{12}. radio listening.

H_{13}. public address (large group communication).

H_{14}. small groups (meetings, committees, etc.).

7. Which bulletin boards areas are in most demand by users?

Because the medium is prescribed by the usage of computers, it is theorized that computer usage would be a key element in board activity.

H_{15}. Boards with computer-related subjects are more heavily used.

8. Are bulletin board preferences the same across both services?

Prodigy is touted by its administrators as a family service, and dictates operational rules that invite a population so inclined. Because there is not a business support forum available, the point is justified.

Similarly, the cost structure, text-based format, international network, on-line industry professionals and business connections (especially with the computer industry) indicates to some that CompuServe is better suited for business or professional usage. If so, those forums related to business and computer management will be more popular than hobby forums or those of general interest.

H_{16}. Business and professional related forums will be more popular on CompuServe than general interest boards.

H_{17}. CompuServe users will be more business/professional oriented (for board use) than will Prodigy users.

9. What usage patterns are common for board users? Are they the same across both services?

Business users may be motivated to use the service more on CompuServe. However, the free element of Prodigy would make extended use more plausible.

Data will be collected showing the number of hours per week for bulletin board use, as well as preferences for "hour" of usage. The data will also show the average number of weekly messages sent and received. Though hypotheses are not suggested in this exploratory data, both will be correlated across the two services.

10. Do users seek other major services or on-line communication methods? Is there a difference between the two services for duplicity of choices?

Again, raw data will show if other on-line services are used by bulletin board users. Differences of CompuServe and Prodigy for these will be evaluated with no a priori hypotheses presented.

METHODOLOGY

An on-line instrument was used to investigate the uses, perceived benefits and nature of the bulletin board communicator. Through a content analysis, the open-ended responses were categorized, evaluated, and reported.

Based on a pilot study, an on-line instrument was prepared to gather data for hypothesis testing and response rates were projected to determine sample size. Simultaneously, the composition of the foria (CompuServe) and clubs (Prodigy) was analyzed and random samples were taken. A request letter was delivered on-line to these individuals which asked for their participation and explained the reasons for the study. Those who responded positively to this request were then sent the on-line instrument. The data were then collected, coded, and analyzed.

The On-line Instrument

From an analysis of the pilot data, a questionnaire was developed that looked at areas of users' bulletin board preferences and the communication consumption patterns as mitigated by bulletin board usage. Five demographic questions were also posed as well as questions relating to boards used, activity of other family members, and usage habits.

Open-ended questions were posed to determine user preferences and behaviors. They also sought to find a description of the perceptions of bulletin boards' impact on communication consumption. Multiple-choice questions were asked to find the demographic data and the relative effects of bulletin board use on other media consumption.

Because the information was to be delivered through electronic mail on-line, certain specifications of the system are binding. With Prodigy, a maximum of 6 pages of information can be sent. Since each page has a 40-space line, and 12 lines per page, a total of 2880 characters is the maximum size. However, this total is decreased by at least 10% since not all lines extend to the full 40 spaces. The instrument was checked for size and readability on the electronic mail pages, and further revised to fit the requirements adding some space for an appealing page.

Because the instrument was delivered by electronic mail and protected by password it is thought the responses are likely to be those of the chosen sample only.

Sample

For a final database containing 75 responses, 125 selections were made for the Prodigy sample, and 139 for the CompuServe sample. These figures reflect the anticipated 60% return rate, rounding for whole numbers in stratification. Systems operators and employees of either service were eliminated due to their atypicality. Also, "lurkers" -- individuals who read bulletin boards but neither send nor receive messages were excluded by the sampling method.

It was feared that messages relating to the service itself could inaccurately portray the bulletin boards because it is the only "free" board area and also because it is only for questioning service operation and support. Therefore, the last forum area of CompuServe, Support Forums, was not included in the stratification. Similarly, the "Ask Prodigy" bulletin board was eliminated.

Though the general bulletin boards allow persons of all ages to participate, one Prodigy board is restricted to those under 18. Because of this and the difficulty in understanding some of the concepts of the survey, "The Club" board was also eliminated from the sample. This gave a total of 8 Prodigy "Clubs" or board areas, and 12 major CompuServe Areas.

The Prodigy bulletin board data was compared to a Simmons Survey (Prodigy, 1990b) on the entire population of Prodigy subscribers. This was a proprietary survey performed to determine the product usage characteristics of Prodigy service subscribers.

Stratification

During January and February of 1992, statistical data were collected for each of these services to acquire a base for stratified sampling.

CompuServe. For CompuServe, every available forum was joined. During the course of data collection, three new forums were added to the service which were added to the original data. An average message count per day was calculated by dividing the number of messages sent by the number of days between them. Since the times of posting are also noted, the date was further divided into "tenths" (0.1 day = 2.4 hours). For large periods of time, this more exact figure is of little consequence. However, for very active boards, many messages are deleted only a few days after posting. In this case, the more precise time designation was important. For the entire set of CompuServe forums, 26,821 daily messages were carried, with an average of 107 messages per day for each of the 254 bulletin boards.

The sample to be selected was stratified to the major areas that make up each service's bulletin boards, and random messagers (both senders and receivers) were chosen from each area. Though the stratification was to the first 12 forum areas, random selections were also based on the relative activity of each forum in each area. For forums with less than a 100 message per day average, one sender or receiver was randomly selected from the forum. For larger forums, an additional selection was made as the forum size increased by a rate of 100. Thus, from a forum an activity rate of 650 messages/day, 6 random selections would be made and added to a database described by areas (not individual forums). A total of 576 elements were drawn from the population. These sample elements were added to a database for random selection to major areas of stratification. After stratification, 139 CompuServe members were sent the final survey. The overall response rate for the CompuServe population of interest was 95 of 135, for a 70.4% response rate.

Prodigy. For the Prodigy selection, the procedure was less precise and is thought to be less reliable. Because the messages are not numbered, it is not possible to measure the rate accurately for several reasons. Though messages can be counted in each board area as limited by a date/time of posting, the length of the time period for averaging was relatively short. Also, because Prodigy returns a certain number of messages (unknown) for user editing, some messages are not posted.

More important, however, is lack of exact data for responses to each message. Though messages can be counted, responses for older messages are sometimes retained, but often discarded. Also older messages have relatively more responses than new messages and are updated constantly. With the broad assumption that responses would be expected to be the same across the boards, an approximate figure for relative board activity can be charted, thus making stratification possible. An attempt was made to secure exact data from the Prodigy Service Corporation, but they refused to release the data. The director of retention marketing for the company did acknowledge, however, that the most popular bulletin boards, in order of activity, are the Arts, Computers, and Homelife.

Because the total message count could not be accurately ascertained the total message activity could not be calculated precisely. The only reliable assessment would be from the company, and they predicted only that 15 million messages would be sent in a year, at the current rate. This indicates that about 40,000 messages are posted daily on Prodigy.

An average reply to message ratio measuring about 6.5:1. was charted across all of the boards. Because 6,758 pages (of 3 messages per page) were counted over the four day period, a daily rate of 5,069 original messages per day is present. If the 6.5:1 response rate is accurate, about 38,000 total messages are predicted, slightly less than the estimate given by the parent company.

The sample was drawn for Prodigy in much the same was as for CompuServe. For each of the 116 sub-categories viewed, a relative rate was found. One sample element was chosen for bulletin board inclusion for each 25 pages of messages generated by that particular board. They were also drawn to represent the ratio of original messages to replies. Two names from each fifteen selected (1 of 7.5, thus the 1:6.5 ratio) were original messages, and the remainder were those submitting replies to original messages. A total of 353 elements were drawn in this manner, added to a database, and stratified according to major category. To eliminate bias for weekend/weekday user selection, the four-day database selection included two weekend days and two week days (Saturday through Tuesday). A total of 126 Prodigy members were included in the final survey. A total of 78 completed surveys were returned from the 126 questionnaires electronically mailed to Prodigy bulletin board users, giving a 62% rate of response.

Coding Procedures

Each response to the survey questions was evaluated for category selection. The "effect on other communication activity" and the demographic responses were self-categorized by the respondents. Some were relatively straightforward, such as other major services used, hours of use per week, number of messages sent per week and other family usage require selecting simple mutually exclusive categories.

Only the question seeking a response to "uses/benefits derived from electronic bulletin boards" needed deeper analysis, coder training, and reliability checks. A special instruction sheet "Uses" with selected categories and codes was prepared from an overview of all the responses. The selected unit of analysis was the semantic phrases (clustered terms) used by the respondent to describe the uses and benefits of bulletin boards. This analysis unit, therefore, could be any grouping of words that express a meaning, and sometimes consisted of one word, but consisted of several sentences at other times.

Using the resultant coding scheme, three coders practiced with sample data sets to eliminate possible code overlaps and to increase understanding of code definitions. After several training

sessions, the coding schemes were agreed upon and test coded. A subset of the data (20%) was cross-coded to check the inter-coder (internal) reliability for the analysis. Using the Scott's Pi (Scott, 1955) statistic, which corrects for chance errors, the reliability was calculated at $p = 0.90$, $p = 0.83$ and $p = 0.85$ for each pair of reliability assessments of the data, indicating the categories were accurate determinations of the respondents' evaluations to a high degree.

As an external validity check, the age and education results for the Prodigy survey responses were compared to demographic data supplied by Prodigy. Though the Prodigy measurement (Prodigy, 1990b) was for all Prodigy users (not just bulletin board users) and was determined in the fall of 1990, it was reasoned that the demographic data for the two should be substantially the same. The comparisons for these two areas is reported in the results section.

RESULTS

The Bulletin Board Audience

The first four research question looked at who uses these services. Several specific hypotheses suggest bulletin board users would differ from the population as a whole. They were tested by comparing sample proportions to the population proportions obtained from U.S. Census data (1989).

It was anticipated that the population of bulletin board users would be upscale in occupation, education, and income, and younger than the general population. All of the tested hypotheses were supported with the exception of the age category. Further, CompuServe shows these tendencies more than Prodigy in each category. Additionally, the SMRB data shows the same upscale trends when comparing typical Prodigy members to their bulletin board users.

Education Data comparisons below indicate a significantly larger number of board users have completed college, have completed a master's degree and have any education beyond high school.

Table 1

Education Level of Bulletin Board Users

Collective Categories	Survey	Census	Z	Sig Level
Post high school educ.	89.7	38.4	13.55	p< .001
Total Completed College	64.3	21.1	13.6	p< .001
Master's or higher	25.9	7.1	9.43	p< .001

n=165

A further breakdown for the two services reveals CompuServe users have a significantly higher overall education level than Prodigy users. Additionally, post high school categories total 94.5% for CompuServe and 83.8% for Prodigy bulletin board users.

Table 2

Education Level of Board Users By Service

Highest Ed. Level	C'Serve Percent	Prodigy Percent
12 or less	5.5*	16.2
Some College	7.7*	17.6
2 years College	3.3*	17.6
Prof. or Tech School	6.4*	0*
Bachelors Degree	38.5	25.7
Some Grad School	7.7*	2.7*
Masters Degree	17.6	18.9
JD,MD,PHD	13.2	1.4*

Collective Category	C'Serve	Prodigy	Z	Sig Level
College Degree	77.0	48.7	-3.77	p< .001**

*frequency is less than 10 **n_C=91, n_P=74

Income Census data indicate almost two-thirds of the population had household incomes of less than $40,000 per year, which is significantly higher than the bulletin board users in this lowest income category. Table 4-3 also indicates a significantly higher rate of earned incomes in excess of $80,000 per year, as compared to the U.S. average for this category. As with the education variable, the frequencies of income for the sample of CompuServe users is higher than those of the income for Prodigy users, but not significantly so.

Table 3

Annual Family Income for Bulletin Board Users

Income Category	All BB's Pct	C'Sve Pct	Pr'gy Pct
less than 20K	4.1*	1.2*	8.1*
20K to 40K	23.0	22.1	24.2
40k to 80K	45.3	46.5	43.5
more than 80K	27.7	30.2	24.2

Collective Data	Census	All BB	Z	Sig
Less than 40K	62.1	27.1	-8.8	p<.001
more than 80K	8.3	27.7	8.55	p<.001

*frequency is less than 10, *n=148*

Occupation This study defines the term "prestigious occupation" as did the Simmons (1990) study as those who have professional or managerial experience. U.S. census figures show that 42.5% of the employed labor force work in the defined prestigious occupations, with the remainder in blue collar and service occupations. For this study, elimination of unemployed, student, and retired persons from the sample (to correspond to the census data figures) allows a comparable, working-force total of 138 persons, 120 of whom are defined as a member of the prestigious employment list that compares directly with the census figure descriptions. This gives 86.9%, a significantly higher percentage (z=10.55, p <.001) of prestigious job rate as compared to the national average.

Comparing the services, samples showed a significantly higher prestigious workforce job rate for CompuServe than for Prodigy(z=4.91, p<.001).

Age Comparing the adult categories, there was no significant differences between the age groups except for the over 65 category, which was significantly higher ($Z=4.47$, $n=156$, $p < .001$) for the census figures than for the bulletin board user population. Gender. Although not a research hypothesis, the gender characteristic was also evaluated. The bulletin board user sample has significantly larger percentage of males (74%) than the respective 1990 census figure of 49% ($Z=6.51$, $n=168$, $p < .001$). Individually, each of the services is significantly (Prodigy: $Z=1.83$, $n=76$, $p < .05$; CompuServe: $Z=7.12$, $n=92$, $p < .001$) higher in the percentage of males than the census, as well. A gender comparison of the services shows that CompuServe has a significantly higher ($Z=3.90$, $n_C=92$, $n_P=76$, $p < .001$) percentage of males than does Prodigy.

Comparing the "General" Prodigy user as described by the 1990 Simmons survey with the bulletin board users of Prodigy in this population shows bulletin board users have a significantly higher ($Z=6.938$, $n_S=1563$, $n_P=76$, $p < .001$) percentage of women than the overall Prodigy population.

Bulletin Board Uses

The second major research question delves into the social impacts regarding the utility and benefits of electronic bulletin boards-- what uses do the participants get from bulletin boards?

Fifty-eight distinct categories emerged from a content analysis of the users' responses. This typology is subdivided into five major categories, selected a priori from pilot tests. These are

entertainment/interest, non-income related information/education, business, communication medium appeal, and socialization. The responses were placed in mutually exclusive categories.

Table 4

Typology of Uses of Electronic Bulletin Boards

	Categories	Cnt	% Resp
	Entertainment/Interest	64	8.6
01	General entertainment; Having good time/fun/play	44	5.9
02	Surrogate for other ent'ment/media forms (handicapped, etc)	2	.3
03	overcome boredom/escapism/curiosity	2	.3
04	challenging/stimulating (use brain)	3	.4
05	taking up time/Relaxation	4	.5
06	browsing/reading interests & thoughts of others	9	1.2
	Info/Education (non-income related)	285	38.1
11	Info giving	27	3.6
12	problem solving	12	1.6
13	Debate/discussion	20	2.7
	Info seeking	s226	s30.2
20	Get info, general	44	5.9
21	Get info unavailable from other sources	17	2.3
22	Get detailed or technical info	13	1.7
23	Get more info	5	.7
24	Get many levels of information	5	.7
25	Get opinions/points of view of others/broaden view	15	2.0
26	Get specialized/specific info/?'s answered/per. interest	41	5.4
27	Get Accurate, quality information (from experts in fields)	17	2.3
28	Keep up w/new/current topics of info/learning (timely info)	28	3.7
29	Self improvement/self-evaluation/self-education	26	3.5
30	Get info to aid purchase	13	1.7
31	Get Serendipity learning	2	.3

Table 4, continued

Typology of Uses of Electronic Bulletin Boards

	Categories	Cnt	% Resp
	Business (computer or other)	87	11.6
40	method for business communication (computer)	14	1.9
41	method for business communication (other)	2	.3
42	Get info for job or business (computer)	15	2.0
43	Get info for job or business (other)	11	1.5
44	Get product Support	28	3.7
45	Give product support	6	.8
46	Market research	1	.1
47	Investments/stock trading	3	.4
48	Contacts	7	.9
	Communication medium appeal	126	16.7
50	easy to use/convenient	10	1.3
51	large audience	13	1.7
52	available at any time of day	10	1.3
53	conserve time with selective reading	2	.3
54	inexpensive, compared to E-mail or PO	8	1.1
55	allows feedback	11	1.5
56	quick method	27	3.6
57	efficient method	7	.9
58	different source of media information	1	.1
59	communicate globally	34	4.5
60	can stay home	3	.4
	asynchronous appeal (time delay benefits)	4s	.6s
70	Demands quality responses--must think to respond	2	.3
72	Non-verbal, "words only" nature, anonymous nature	2	.3
	Socialize	179	23.9
80	can eavesdrop/lurk as unknown/anonymous	4	.5
81	Make friends/meet new people	28	3.7
82	find mates	2	.3
83	Eliminates prejudice of age, sex, race	5	.7
84	allows acquaintance unavailable any other way	15	2.0
85	"listen" to others	5	.7
86	use promotes new travel, interactions	7	.9
87	relaxes communication apprehension problems	9	1.2
	"talk" to (Socialize Area)	104s	13.8s
90	people	21	2.8
91	experts in field/intelligent people	17	2.3
92	those with my interests	36	4.8
93	those with different views	7	.9
94	people of different ages/backgrounds	7	.9
95	trusting/giving people	9	1.2
96	friendly/enthusiastic people	7	.9
	Totals	**745**	**100.0**

Transmission of information and education. The most prevalent single area reported by bulletin board users is in the transmission of information and educational content in a non-income related way. More than one-third of the total uses mentioned by the 173 respondents included this passage of textual information for educational and other methods of personal informational enhancement (285 mentions or 38%). Within this area, two similar categories were mentioned most frequently. "Get general information" and "Get specific information" collectively accounted for 85 or 11.3% of the responses. Not dissimilar are responses that show bulletin boards are used to "keep up with new information," "self-improvement/self-evaluation/self-education" and "get quality, accurate information from experts in the field."

Socialization. The second-most cited group of reasons chosen by the respondents is the element of socialization with a percentage of 23.9% of the total uses mentioned. A sub-category emerged that appears as a possible surrogate for interpersonal communication-- "talking". More than 100 uses mentioned the phrase "talking to . . ." people in different categories, for a 13.8% "talking to" rate. Most frequently mentioned was the single area of "talk to those with my interests" with 36 selections for 13.8% of the total uses. Similar categories were "talk to people" (2.8%) and "talk to experts and intelligent people" (2.3%).

Other socialization qualities mentioned as desirable uses were the abilities to "make friends and meet new people" (3.7%) and the special qualities of bulletin board usage that "allows an acquaintance unavailable any other way" with 2.0%.

Medium appeal. The modem-based electronic bulletin boards may be different from most other communication forms, and the users noted qualities that emerged as a factor called "communication medium appeal" with a total of 17.4% of the total responses. This division represents factors of the medium that makes it different and desirable to its users. Most often noted in this division is the enablement by the medium to "communicate globally" with 4.5% of the selections. Other qualities cited as desirable are those of "quickness" (3.6%), "large available audience" (1.7%), "allows feedback" (1.5%) and "easy/convenient to use" and "available at any time of day," both with 1.3% each.

Computer or Other Business. A business use was cited 87 times by the 173 respondents. Within this division, the four most popular uses cited were to "get product support" (3.7%), "get info

for computer job or business" (2.0%), "method for computer business communication" (1.9%), and "get info for non-computer related job or business" (1.5%).

Entertainment. The lowest number of mentions for uses of electronic bulletin boards among the divisions was that of "entertainment/interest" with 8.6% of the total uses mentioned. However, the single most popular use mentioned with 5.9% was "general entertainment: having good time/fun/play." Also in this category with a 1.2% citation rate was the quality of bulletin boards for "browsing/reading the interests and thoughts of others."

Table 5

Major Categories of Uses of Electronic Bulletin Boards

Category Division	Count	% Responses
Entertainment/Interest	64	8.8
Info/Education (non-income related)	285	38.2
Business (computer or other)	87	11.7
Communication medium appeal	130	17.4
Socialize	179	23.9
Totals	**745**	**100.0**

Prodigy vs CompuServe. A comparison of the two systems with the uses categories showed only one category with a statistical difference. CompuServe bulletin board users were significantly higher in the category of business use of the boards ($Z=3.31$, $n_C=95$, $n_P=78$, $p < .001$).

Table 6

Prodigy/CompuServe Comparison of Uses of Electronic Bulletin Boards

Category Division	C'Sve Count	C'Sve Rate	Prodigy Count	Prodigy Rate
Entertainment/Interest	25	5.8%	39	12.6%
Info/Education (non-income)	158	36.4	127	41.0
Business (computer or other)	78	17.9	9	2.9
Comm. medium appeal	79	18.0	51	16.5
Socialize	95	21.9	84	27.0
Totals	**435**	**100.0**	**310**	**100.0**

Summary. Generally, then, board users mentioned information/education most frequently when asked about board uses, followed by socialization, communication medium appeal, business, and finally, entertainment. When comparing the two services, CompuServe users mentioned business usage more often than did their Prodigy counterparts.

Effect on other communication activities.

The next research questions sought answers to how bulletin board usage affects other "older" methods of communication. It looked for activities that are supplanted, complemented, or augmented, if any.

Home-based communication activities. It was hypothesized that home-based, non-business, information seeking or entertainment activities would decrease. This led to seven hypotheses that predicted one-tailed (reductions) in television viewing, book reading, magazine reading, telephone talking, letter writing, face-to-face conversations, and other on-line communication.

The data showed a significant decrease in television viewing because of bulletin boards ($t= -12.53, n=170, p < .001$). This was the largest difference found in the data for this research question. More than half of the respondents (94) noted that their television consumption had been lowered because of their bulletin board activity, and only one person responded that it had increased some. The responses also point to a significantly lowered ($t= -3.898, n=170, p < .001$) book reading activity because of bulletin board use.

"Bulletin board usage reduces talking on the phone" was also supported, ($t= -2.36, n=170, p < .01$), but the mean was probably higher because of a misinterpretation, by some, of the question. Though the question clearly stated "talking on the phone", a few respondents noted that, since the modem "used" the phone, a higher phone use was made, and thus a "4" or "5" was entered. These data were not changed; however, it should be noted that the mean was probably skewed (higher) because of this misinterpretation.

Also supported was the hypothesis suggesting a reduction of letter writing because of bulletin board usage ($t= -1.665, n= 170, p < .05$). This hypothesis might also have been more strongly supported with a clearer understanding by some respondents. Several persons noted that they wrote more letters online through bulletin boards, while the a priori intent was to determine the effect of

board use on "posted" mail. Unfortunately, this problem was not anticipated, and thus not clearly spelled out for a few.

The hypotheses suggesting a lowering of magazine reading activity and a reduction of face-to-face (interpersonal) and other online communication because of bulletin board use were not supported.

Out-of-Home Communication activities. The other communication activities responded to were out-of-home activities, so it was hypothesized that bulletin board usage would have no effect on them. These two-tailed hypotheses were radio listening, public address (large group communication), and small groups (meetings, committees, etc.). All of these were supported by the data.

Table 7

Effects of Bulletin Board Usage On Other Communication Activities

Comm. Activity	Mean	N	S. D.	Student t-stat	Sig. Level
TV Viewing	2.229	170	.800	-12.53	p<.001
Book Reading	2.79	170	.687	-3.898	p<.001
Magazine Reading	2.959	170	.725	-0.735	p<.233
Phone Talking	2.835	170	.908	-2.36	p<.01
Letter Writing	2.888	170	.880	-1.665	p<.05
Face-to-Face Speaking	2.965	170	.614	-0.741	p<.23
Other On-Line Activity	3.09	170	.742	0.571	p<.28
Radio Listening	3.018	170	.591	0.396	p<.68*
Public Communication	3.059	169	.432	1.7755	p<.08*
Small Group Comm.	3.041	169	.492	1.083	p<.28*

*Two-tailed. All others are one-tailed, a = .05

Effects on Communication Activities by Service. The samples were tested separately to see if a marked difference appeared, or if the composite sample was bimodal.

CompuServe users responded that television viewing, book reading, talking on the phone, letter writing other on-line activities (e.g. electronic mail, downloading, and real time communication messaging) and public (large group) communication activities were significantly reduced by their bulletin board activities. With the exception of other on-line activities, they followed the same significance as did the full sample of both services.

Bulletin Board Preferences

The seventh research question sought the answers to the popularity of the individual bulletin boards available from each service. Further it was hypothesized that computer-related boards would be used more than any other boards.

Because of the bimodal nature of the collective data, the systems were separated to answer the stated hypothesis. For CompuServe, the message count is larger for computer-related boards, thus supporting the hypothesis. The hypothesis was not supported by the Prodigy data.

To answer this question, the relative activity of each board was measured over a period of time. These were noted in the literature review as a preliminary step to achieving a stratified sample. These boards are organized into 8 clubs in Prodigy, and 12 forum areas in CompuServe.

The Prodigy computer board accounts for almost one-fourth (24.05%) of the bulletin board traffic, second only to a slightly higher "Arts Club" set of topics. However popular the computer boards are on Prodigy, they are not the most popular board. When these two are added to the "Home Life Club," nearly three fourths of the total messages are accounted for.

With CompuServe, however, computer-related boards comprise the bulk of the service, it appears. All of the boards within the Entertainment/Games, Hardware, Electronic Publishing, and Software forums, and a large quantity of the Entertainment and Financial forums are computer-related. Because many of the forums are listed in multiple areas, it is difficult to determine the exact proportion of each area. However, subtracting the non-computer related forums from the entertainment and financial areas, computer forums comprise a total of 59.2% of the CompuServe boards (in message per day activity), which is significantly more than the next most popular Hobby/Lifestyle/Health Forums, with a 20.4% total.

Board preferences by Systems. Research question eight sought to find if bulletin board preferences are the same across both services. From the results above, computer-related boards are clearly the more popular board on CompuServe. Also, because there are no "professionals" boards on Prodigy as there are on CompuServe, users are hindered from pursuing business-related interests.

Because business and non-business uses can be applied to the CompuServe boards, it was questioned whether business or general interest boards would be more popular. From pilot data

responses, it was hypothesized that the business and professional related forums would be more popular than general interest boards on CompuServe.

The hypothesis is supported. The non-business areas of CompuServe include aviation, hobby/lifestyle/health, sports, and travel, as well as selected boards from education, entertainment, and science/technology. The remainder are business-related boards. Although business may take place in non-business forums (and vice-versa), the approximate ratio of business to non-business boards for CompuServe is 63% to 37%, indicating that business boards are much stronger, in total, than the non-business boards.

Additionally, the makeup of the random selections of each of the populations shows a significantly higher percentage of children (under 18) using Prodigy as opposed to CompuServe. From previous data, we note that 12.8% of the Prodigy sample is under 18, while only 1.1% of the CompuServe is in that age category, a significant difference.

Summary. CompuServe and Prodigy serve different groups. CompuServe system serves a high percentage of persons who use business and computer areas of bulletin board topics. Prodigy users found a more balanced use, with Homelife, Computer, and the Arts boards serving three-fourths of the users. Part of this difference between the board may be accounted for with the variations in the proportion of younger users.

Bulletin Boards as a Family Activity

To look further at the area of whether a board is a "family" service, the questionnaire asked whether other family members used electronic bulletin boards. If the respondents who live alone are excluded from the calculations, 19.6% of the CompuServe sample stated that there are other members of their family who use the service. On the other hand, the Prodigy sample shows a much higher family-oriented, general interest service, with 65.7% of the respondents citing use by other members of the household. When calculated with a 2 x 2 contingency table for goodness of fit of the system vs family members or "no one else," it was determined that the values are significantly different from the expected frequencies ($c^2 = 33.2$, $df = 1$, $p < .001$).

Bulletin board use, it appears, is a family affair with Prodigy users, but is of much less consequence with the CompuServe users.

Usage Patterns

Question nine sought to find answers to the common usage patterns that exist for bulletin board users, and to compare those across the two services. Below are the results for the frequency and time of use, number of hours per week, the number of messages posted per week, along with correlations across the two services.

When asked about their typical patterns of use of bulletin boards, more than half (62.7%) said they used the services at least once daily. Though more CompuServe than Prodigy users signed onto the service daily or greater (65.4% compared to 59.8%), the difference was not statistically significant ($Z=-0.55$, $n_C=78$, $n_P=72$, $p = .29$).

The electronic bulletin boards are busier at night (59.2%), with a high percentage of use in the very late hours. When the two services were compared, there was no significant difference discovered in any of the categories.

The respondents reported a range of 41 hours of use of bulletin board services. The modal amount of time per week, by hours, was one, as estimated by 22% of the sample of users. For the collective sample, they reported an average use of about six hours per week.

Further comparison of the data reveals the collective figures may be misleading, however. Prodigy members who used the bulletin boards for only 1-3 hours per week comprise 20% of the sample, while the same category for CompuServe was 71.1%, a significant difference ($Z=-3.60$, $n_C=83$, $n_P=75$, $p < .001$). A means comparison with an independent sample *t*-test indicates a significant difference between the means ($t=-6.30$, $df=97.44$, $p<.001$). Further, the Mann-Whitney U test was used to test the equality of mean ranks for the two services. Like the t-test, it also showed a strong rejection ($z=-7.34$, $n_C=83$, $n_P=75$, $p < .001$) of the two-tailed null hypothesis ($m_1 = m_2$).

Bulletin board users, across both services, averaged sending 17.6 messages per week, with the most frequent citing (mode) by users as 10 per week. A cursory look at the sample means reveals Prodigy users were slightly more active in message sending, with a higher "low quantity" usage (10 or fewer) rate of 63.8% than CompuServe users at 49.4%. However, this difference is insignificant at the a = .05 level ($z=1.74$, $n_C=91$, $n_P=61$, $p = .09$).

Testing the average message rate, as with the hours per week online comparison, a means comparison with a two-independent-sample t-test revealed an insignificant difference ($t=1.04$, $n_C=91$,

n_P=61, df=128.5, p = .301, two-tailed). For a difference in medians, the Mann-Whitney U Test was calculated, with a similar failure to reject the null hypothesis (*z=-1.807, n_C=91, n_P=61, p = .08*). One Prodigy user reported an average of 210 messages per week, an outlier included among only 22.7% of Prodigy users who posted more than 15 messages per week. This compares with 37.4% of CompuServe users in the same grouping, an insignificant difference at the a = .05 level (*z=1.91, n_C=91, n_P=61, p = .07*).

Summary. Bulletin board users are most often daily users who send about 18 messages per week and access their services in the evening, especially in the late evening hours. Users from both services exhibit these habits.

CompuServe users spend less time accessing their service, with most users spending less than three hours per week. Prodigy users consume three times more clock hours on the modems and averaged about nine hours per week online. Users from both services send about the same number of messages, averaging about 18 per week.

Multi-Service Users

The final question sought to find if bulletin board users were active with more than one service. Do they also use CompuServe (for Prodigy users), Prodigy (for CompuServe users), America On-Line, GEnie, Internet, a local bulletin board service, or some other service?

Of the 169 valid cases, more than half (52.7%) indicated they used more than the online service with which they were surveyed. The CompuServe users were more active in multi-system usage, surpassing Prodigy by 61.3% to 42.1%, a significant difference (*z=2.46, n_C=93, n_P=76, p < .05*). CompuServe users were also more active than Prodigy users in choosing another major system (America Online, GEnie, and Prodigy/CompuServe).

Concerning the choice of other services used, CompuServe users chose Prodigy more often than the next two most popular services with 32.3%. Prodigy users chose CompuServe as their top second choice, but with half the corresponding rate as CompuServe user's favor with Prodigy.

Other than the two systems in this study, collectively, the users selected America Online as the most popular added service for bulletin board use, followed by GEnie. The categories of "local bulletin boards" and "other national boards" were not subdivided into individual services.

Summary

Generally, then, bulletin board users are upscale in occupation, education, and income, and more likely male than the general population. They are more interested in information retrieval that bulletin boards provide, but socialization is a very important factor.

The use of bulletin boards affects television viewing severely. Users also consider that book reading, phone talking, and letter writing will also be lessened. The users are likely to participate in more than one service, and are very active in their habit with daily usage, usually in late evenings, sending an average of 18 bulletin board messages per week.

Differences in the two services are most apparent in the most frequently used boards, with CompuServe strongly business and computer-oriented. CompuServe users are more upscale than their Prodigy users in income, occupation, and education level, and more likely to be male and working-age. The Prodigy users are more balanced in board selection, and have a broader base of spouses and children who use the service than do Compuserve users. The Prodigy users are also much more active on-line, with 9:3 ratio of hours per week as compared to CompuServe users.

DISCUSSION

"I use the bulletin boards mainly because I enjoy the interaction with people all over the globe. It's a unique way of communicating because there are only words on a monitor, so there is no prejudice as to sex, race, age or whatever! There are a lot of intelligent, interesting people online. I find the exchange of ideas in a forum atmosphere with folks from all over...stimulating, challenging, humorous...I could go on and on...but it may be slightly biased since I met my wife online! <g>"

--CompuServe Respondent

"I liken E-mail to the old sitting around the general store's pot-belly stove and chewing the fat that you used to see on rural America sitcoms. It is a great place to chat, to have arguments and to discuss what goes on in the world, with the structure of a particular topic, and with the proviso of "clean" discussions. The BBs are a good place to exchange ideas, and to learn new things about a topic you are interested in."

--Prodigy Respondent

This study examined and characterized the senders and receivers of electronic bulletin board messages. In particular, it looked at the two broad research areas of adoption and social impacts.

Highlights and Implications

Demographics of Users. Based on Rogers (1986) research with other new media, four hypotheses were proposed relating to the characteristics of bulletin board users. The first three hypotheses, suggesting bulletin board users are higher educated, wealthier and work in more prestigious occupations than the population of Americans (1989 census data), were supported by the data.

Educationally, less than 10% of board users have no college experience, compared to the national rate of 62.2%. This provides further evidence that technologies providing enhanced information services are used less by the disenfranchised -- the poorer, lower-educated, working-

class (or unemployed) persons. Additionally, because many board users are from occupations that typically use computers, those without this job-required equipment may be less likely to purchase it, even if empowered economically.

When the two services were compared in these demographic areas, it was found that CompuServe users are significantly higher than Prodigy users in overall education level and employment in prestigious occupations, but not in annual income.

Prodigy and CompuServe draw a separate "audience," it appears. The Prodigy board's largest single category of users is students, which is nearly last in the CompuServe groupings. The small cell size (3 & 18), make it necessary to use caution in interpreting these results, however. Similarly, nearly half (43%) of the CompuServe sample are employed as computer or data processing specialists, while the same Prodigy category is much lower (13%.) Again, these cell sizes of 40 and 3, respectively, are relatively low to make unreserved judgments. The CompuServe "audience", it appears, is highly skewed toward those with computer expertise.

These data also support the theory of Dutton, Rogers, & Jun (1987) that use of computers is predicted accurately by socioeconomic status, and that formal education is more highly correlated to its use than any other variable. Their concern with the disparity between those on each end of this socioeconomic continuum appears to be justified at this time, but should decrease as the price of personal computers declines.

The fourth hypothesis that bulletin board users are younger than those in the national population is not supported. However, the differences in ages between the two services is marked. Prodigy has a higher percentage of younger persons than does CompuServe. This gives further credence to the marketing and promotion of Prodigy as a family service, thus offering "protection" from message postings that are deemed inappropriate for younger readers.

The study does not support the conclusions drawn by Rogers (1986) as noted in the literature review, that younger persons will make up a larger share of the population of new media users, because they are less timid in experimenting and adopting new media patterns.

Though not proposed as a hypothesis, gender differences were compared to the U.S. population as well, and has a decidedly higher proportion of males as compared to the census figures for 1991. Similarly, the CompuServe users were more likely male than were Prodigy users. The

gender comparisons provide further evidence for the view that the information empowered are highly imbalanced toward males. Comparative data also further the notion that Prodigy is more balanced gender-wise, as well as the previously mentioned areas of occupation, age and education level. The contention that the Prodigy service appeals to a wider segment of the population is supported by the data.

Surprisingly, differences appear to exist between the bulletin board users and the on-line service subscribers as a whole. Comparing bulletin board users to respondents of a 1990 Simmons Marketing (SMRB) Survey (Prodigy, 1990b), bulletin board users are significantly lower in college graduation rates, lower in annual income, lower in percentage of male users, and lower in percentages of prestigious occupations than online service subscribers as a whole.

However, these results are highly suspect for several reasons. First, the SMRB study chose only those who were subscribers ("A" users on the Prodigy service), thus excluding spouses and children, while the bulletin board users were not selective in this regard. Secondly, the study was performed nearly two years prior to this study when the number of Prodigy users was much less than its wider audience now. Because of this, these "early adopters," as noted by Rogers (1986) may have had considerably different characteristics than today's users. Though still in the "early take-off" stage, the populations could be acutely different. Also, The SMRB study, with its comparatively higher rate of non-response, may have also incurred bias in sampling.

Uses of Bulletin Boards. Drawing from the views of Rogers (1986), the question of social impact was questioned by placing importance on the reasons individuals use the new technologies.

"In my day-to-day encounters, it's uncommon that I encounter people with similar interests. By drawing upon a nationwide network of subscribers, I can cull expertise from various disciplines--be it gaming, programming, or small business. Also, barriers that interpose in face-to-face communication including physical appearance disappear with this form of communication. It's not uncommon that I'll find myself in interchange with a famous author. Also, I find people more likely to respond to E-Mail communication than traditional forms. There's a greater sense of community and obligation."

--CompuServe Respondent

As might be expected, transmission of information, in a non-business-related way, is the major function of bulletin boards. Bulletin boards are primarily a way of receiving and giving information. The comparison to the "real" (non-electronic) bulletin board is important here. Most people post, and read, messages mainly to give or get information--not for fun, not for socializing. Information giving seems to be the forte of some bulletin board messagers, who noted they were happy to be on the boards just to give information or solve problems for those with questions. Ready recipients of this knowledge (especially from the CompuServe sample) often commented about the quality, accurate, detailed information that was free for the asking, often from experts in the field.

Others noted that the information gained in this way was available through no other source. Scrutiny of the bulletin board topics and breadth of hierarchy in the systems shows that areas are available that are dedicated to almost any area. This specialization enables a rich education in almost any particular area, and may allow one to stay abreast of developments in that field.

"I enjoy the wider opportunity to talk to people who share my interests. It's not easy finding others with a fascination for growing lilies, for example, who also live next door."

--Prodigy Respondent

Information gathering has been noted as the hallmark of Toffler's "Third Wave (1980)." The electronic bulletin board provides a wider segment of the population (growing as the computer diffuses through society) a new method to receive vast quantities of rich information, tailored to the areas, and even the specific questions, of the user.

The second-most cited reasons for using bulletin boards is -- that because of the difference between a bulletin board and an electronic bulletin board--a method exists to "talk to" another. Though not face-to-face, not voice-to-voice, it is decidedly an ability to talk to, or socialize with other persons. Spurred by the medium's interactive ability that allows direct contact with others, it also provides a safeguard of anonymity which allows users to say more than they might if they were really "speaking."

Keys to socialization use can be seen with responses that showed respondents used boards just to "talk," even though each surely knew this was not the correct term. The transference of "talking" via the boards seems to be felt as very important to a large portion of the population.

Though the largest quantity said "talking to those with my interests" was of importance, it was followed in response frequency with simply "talking to people."

From many responses, though the data here were not quantitatively monitored, many individuals use the boards just to be "in touch with" other persons--experts, those with similar interests, those with different views, those of different ages or backgrounds, or those who seem to be giving, trusting, friendly or enthusiastic people. The judgments of personal qualities of others, even with terms that might belie a personal "face-to-face" acquaintance, were all made -- at a distance, with only two dimensional characters formed as an electronic image on a video display tube.

"I am more inclined to join in a conversation that I would have been if it had been face to face. I am an INTP and typically feel more at easy in an observer role. However, on a bbs, I feel uninhibited and am willing to put my two cents worth in at a moments notice."

--CompuServe Respondent

This desire for "talking" in this way exists for a wide variety of reasons. One reason may be because of physical handicaps that preclude outside activity, others for communication apprehension, and others for undetermined causes. In any case, bulletin boards serve as a surrogate for interpersonal communication, and are laden with some of the same conventions, habits, and demands as face-to-face communication. Though most would not call the boards interpersonal, they meets so many of the prerequisites that it is not surprising the term "talk" is used by board aficionados. These findings back up previous literature (Dominick, 1983) proposing that a new category be established -- machine-assisted interpersonal communication, incorporating interpersonal with mechanical communication. On occasion, electronic bulletin boards even supplants face-to-face communication.

"Since leaving college, I've only had one or two friends. I use Prodigy to broaden the number of people I know and talk to. Whether this is a good or bad thing, I don't know. Maybe I use Prodigy as a crutch, and that keeps me from meeting and talking to real people, but I'haven't really paid much attention to it. I will say that I don't think it's taken the place of my getting information and entertainment from other sources."

--Prodigy Respondent

Even when the term "talk" was not specifically used, respondents showed their desire for the presence of others, though they are it electronic in nature. "Making friends and meeting new people" was most frequently cited. Together with "finding mates," and "allows acquaintance unavailable in any other way" was given by 6% of the total responses, indicating about one in sixteen find the friendship factor important. Two of the respondents (see introductory quote at the start of this chapter) even indicated they married persons they met online.

These friendships are often formed because the characters on the screen don't depict the characteristics of the person who sent them.

"I use BB'S to get info, not make friends, but that has happened to my surprise. I find most of the members very giving and that is rare in this give nothing unless you get something society."

--CompuServe Respondent

As noted in the literature review, non-verbal surrogates are numerous in some computer-mediated communication systems (particularly the real-time conferences). However, Shamp (1989) found that messages on bulletin board services are virtually indistinguishable from one another, and little information outside of content is exchanged. Though not a part of this study, these non-verbal characteristics are important and have been mimicked by board writers.

Part of the group interactions are even better, it appears, than might be present with face-to-face communication. Several noted that this socialization was important because it eliminates the prejudice of age, race or even sex that is often prevalent in face-to-face.

"The BBs have exposed me to a large group of people that I wouldn't have known otherwise. I've gotten to know some of them very well. Also, on the BBs and in e-mail, people sometimes tell other people some very personal things, maybe because they're not face-to-face and probably will never meet, so it's not threatening. They can get things off their chests without feeling too embarrassed. I know that I've told people on the BBs & in e-mail things I haven't told some of my friends."

--Prodigy Respondent

Some users find solace because of this anonymity, which allows a relaxation in communication apprehension problems that might be present. Others report they discovered this anonymity by just eavesdropping on the conversations of others -- termed "lurking" by those on the boards -- completely unknown, but still receiving that touch of the presence of others. Those who are lonely, aged, or infirmed, those who may have personal disfigurements, or those who are put off by prejudice of race, age, or sex may find benefit to this anonymous appeal that still allows a touch with others.

"The use of BB's and especially electronic mail has had a tremendous impact on my ability to reach people and to administer my business. Messages between the US and Germany that take several days can go through generations of replies within a day. What an enhancement!"

--CompuServe Respondent

The third grouping of uses or benefits of boards are those that were noted as qualities of the medium itself, noted as "communication medium appeal." Most frequently cited was the ability of the medium to reach persons at any place. Though "global" may be a better term for CompuServe users, because the service is used in certain cities around the world, Prodigy users often were awed by the knowledge that they could communicate, in an almost personal way, to distant areas. The "global village" concept of McLuhan (1964) is within reach of bulletin board users, and a large number of users find this spectacular, as well as important.

This further strengthens the McLuhan view that the medium of communication is more than just the carrier. With the phrase, "The medium is the message," he says the nature of the human-machine interface is a very real part of what is sent to a receiver. That is, the computer, with electronic bulletin boards, becomes mixed with the original message and can even change its perception.

Because the medium is digital and travels electronically (and for at least a portion of the journey through fiber-optics at the speed of light), it provides answers rapidly. Though a gatekeeper hinders the flow (especially with possible return for undesirable messages with Prodigy), it is possible for bulletin board messages to have a send-receive loop several times in even one day. This

response is lowered by the inability of users to stay on line constantly (see analysis of hours of use). Current conceptions of time, space, cost, and media (paper vs screen) need modification as bulletin board messages and other electronic transmissions become not just wizards of marvel, but tools of a new generation. Consider IBM chairman John Akers statement, "In the final analysis, what this thing (Prodigy) has to do is change people's habits . . . Today, the storage of data is 95% paper and 5% electronic" (Chakravarty & McGlinn, 1989).

The literature of Rogers and Kincaid (1981) rejected the idea of following linear models. These models describe effects of one-way media, but may be inappropriate for interactive systems with different assumptions of feedback. It indicates that fast, interactive, almost synchronous messages could be very well described by their convergence model which proposes the mutual process of information transfer between participants in a system (figure 3-5, p. 45). This model eliminates the linear view of sender and receiver found in the Shannon & Weaver model, and replaces the constructs with "participant," which would seem to fit very well into the bulletin board description.

Other important media considerations are the availability of large audiences, the enablement of a nearly instantaneous feedback channel for clarification or rebuttal, ease of operation and services that are available at any hour of the day or night. Though the computer was once thought of as difficult to understand and operate, new interfaces and graphical user interfaces (such as Macintosh and Windows®) can be used with just a mouse click by even those who are computer-phobic. With the spread of these devices through lowered costs because of economies of scale and competition, the disparities between the "haves" and "have nots" should decrease rather than increase.

"Virtually all of my online communication is work related. I work for a software company and am the official online representative for my company. I receive orders via email, receive and answer technical support questions for our products, and create a "presence" in the public forums (boards) so that the online community is aware of our company and what we can offer them."

--CompuServe Respondent

The "business use" context was delineated from the other uses in this study, even though it is part of the information area as well. Even with the fourth most popularly suggested response,

overall, the results are highly skewed toward the CompuServe sample. A significantly higher rate of business use was shown with CompuServe, further indicating the business-like quality of the system. Its users were enamored, it seems with the quest of keeping responses non-trivial and quality. This is further supported by previously cited data showing the high percentage of business-type boards, the large group of users in the business-age category (36-50), the relatively low percentage of youth, the prominence of men, and the significantly higher percentage of those in the computer-related fields.

In contrast, the Prodigy users are prohibited from doing business on the boards by the user agreement. Members agree "not to engage in advertising to, or solicitation of, other members to buy or sell any products or services through the Prodigy service without Prodigy's written consent." In addition, the agreement says,

"Prodigy reserves the right to review and edit any material submitted for display or placed on the service, excluding private electronic messages, and may refuse to display or may remove from the service any material that it, in its sole discretion, believes violates this Agreement . . ."
(Section 8, Prodigy Member Agreement, April, 1992).

Understandably, as an advertiser-supported company, Prodigy rejects free business use that might be competition for its advertisers. The only "business use" mentioned by a few Prodigy users was the category for receiving computer-related information by others in the "computer club." This may be a flaw in the categorization, because computer-use does not necessarily indicate business use.

Coupled with the rejection of material which may be offensive to others, the fears of Wegner (1985) which were pointed to in the literature may be justified.

"I use the "boards" for fun. BB's are rather new to me since we first got Prodigy in January. Using the boards are a form of recreation for me. They are not a necessity to my life...just an enjoyable diversion."

--Prodigy Respondent

Mentioned as least important in the five rankings of uses or qualifies of bulletin boards was the entertainment or interest division. Again, this area was significantly higher for Prodigy than for CompuServe respondents. The single most popular response category was that of having a good time

through the fun available on the boards. Particularly with Prodigy, (as also noted by the number of hours spent on the boards) users were on the boards because they enjoyed it. Other subtopics listed were the escapism factor (perhaps more prevalent with those who are more lurkers than participants), browsing/reading others thoughts, and surrogate for other entertainment or media forms. The latter category suggests bulletin boards may supply entertainment needs that other media cannot match. Where the physically handicapped may be precluded from face-to-face interactions, bulletin boards may allow this as an electronic substitute. One parent noted that his deaf son used the boards for communication many hours of the day, so he could "talk" to others and experience many friendships, without prejudice, available in no other way.

For these areas, considering the bimodal distribution suggested above, it appears again that Prodigy users consider entertainment an important factor, but CompuServe users find it to be less so.

This typology of uses, though not providing surprising categories for a medium and its characteristics, provides a benchmark base of data for other studies to further examine this increasingly popular medium. As noted in the literature review of Pool (1983), however, when a medium is in the early stages of development, predictions are usually inaccurate at best, and may be unknown. However, it should be beneficial as a start for a more thorough, quantitative examination through tested theoretical concepts, such as the uses and gratifications approach. It could also be further analyzed with the functionalist perspective by looking at the manifest and latent functions and dysfunctions of bulletin board use as suggested by the functional analysis of Wright (1960).

Effect on other communication activities. Crucial to communication scholars, at least, is the potential effect bulletin boards will have on the use of existing media. Will they be complemented, augmented, or supplanted?

"I guess the greatest impact this has had has been to get my duff off the couch in the morning, stop watching inane TV, and get my mind working by reading others' thoughts and responses to my thoughts."

--Prodigy User

"Well, I used to talk on the phone a lot. So much in fact, I had to get call-waiting. But I found something that holds my interest more."

--Prodigy User

Hypotheses five through fourteen were presented suggesting that several communication activities would be reduced by the use of bulletin boards. The data to test these one-tailed hypotheses indicate support for those showing a reduction in television viewing, book reading, telephone talking, and letter writing. Not supported were those pointing to reductions in magazine reading, face-to-face conversations, and other on-line communication.

These hypotheses were drawn because a reduction in some activity must occur, especially if a sizable quantity of time is devoted to a new-found use for bulletin board messaging. Since it is a communication medium that delivers information, education, opinions and entertainment, it follows that the use of some communication media would probably be reduced as a result.

Television, it appears from the data, is the first to be reduced, or even supplanted. Most (55%) of the respondents noted that their television consumption had been lowered because of their bulletin board activity, and only one person responded that it had increased some.

With a tendency to often be a diversion, the television audience is reduced by bulletin boards, which are thought of as a highly active form of communication. While the reduction in the audience is trivial at this point, growth of the boards from the infancy through the takeoff stages as depicted by Rogers (1986), may make it a competitor for television's share of the market. Bulletin boards and other online activities could become a real competitor for the communication needs of Americans. Because new communication methods are inevitable, bulletin boards may grow at a much faster pace in the future. For example, the development of fiber-optic transmission capabilities from the user to the server could mean interactive transmissions with sound, color, full motion and logic capabilities. If the entertainment functions of television are present to a sufficient degree, the supplantation by bulletin boards could eliminate many "couch potatoes."

Future use cannot be accurately determined, and the direction of any medium is open to question. Television, bulletin boards, and the telephone, for existence, may ultimately merge into one instrument that eliminates other media choices. New methods of delivery, technological advancements and research will amplify these changes.

It also appears that time spent with personal book reading could be reduced by board use. This figure could be misleading, because the book reading rate of Americans is already quite low.

However, a few respondents suggested that "how-to" texts would be supplanted by bulletin board information.

Though letter writing, as interpreted in the survey as postal delivered mail, may suffer, the actual result may be an increase, ultimately, in letter writing, but in the different form of electronic mail. One advantage suggested by numerous respondents was that bulletin board use had strengthened their writing abilities and made them more confident about putting ideas into "print." Several asked for clarification on "letter writing," suggesting that posted mail was indeed lessened, but electronic mail was enhanced through the available medium and familiarity with the system. Resulting from board use, it appears, will be a reduction of posted mail, and an undetermined increase in electronic mail. Electronic mail, though not a subject of this study, should augment traditional views of posted mail.

The reduction of magazine reading was not supported by the data, as well as reductions in face-to-face conversations and other on-line communication. These are seen as either not interfering with bulletin board use, or as providing information that boards do not give. Though many users see some interpersonal qualities in bulletin boards, as previously noted, they still find the activity as only a supplement to personal contact.

Communication activities primarily considered "out-of-home" were not considered a threat to participation in bulletin boards, so research hypotheses were stated predicting bulletin boards would have no effect on radio listening, large group communication, and small group communication. All three hypotheses were supported.

A problem may exist with the radio listening and large group hypotheses, however. Though the data failed to reject null hypotheses, a thorough description of radio as a "background medium" may have led to significance as a complement to bulletin board activity. Several respondents noted that their radio helped them with board activity, and the radio comes on when the board comes up. Further research, with a carefully worded explanation, could resolve this misunderstanding.

The "large group" communication question was also not stated with the meaning in which it was taken. Though public speaking was the intention, several understood it to encompass the large, public arena present with electronic bulletin boards. Clearly the audience in this regard is large, and is

public. The survey question was just muddled when understood within the traditional context. This also caused possible error in the results shown.

When the services were compared, the Prodigy data indicated that only television viewing and book reading activities would be affected by bulletin board use, while CompuServe users added talking on the phone, letter writing, other on-line activities and public (large group) communication activities to this list. It is easy to see why "other online communication" would be presumed changed by CompuServe users, since they have access to some services Prodigy users do not (e.g. downloading and real time communication messaging).

Board Preferences. Hypotheses 15, 16, and 17 looked at the relationships between and within the services to determine which boards were most active, and thus was the choice of larger audience shares.

Because the medium requires computer usage, hypothesis 15 stated that computer related boards would be more heavily used than any other.

The stratification procedures outlined in the methodology provided a count of the bulletin boards over time. This also allowed the areas to be compared with each other in a system, and comparisons between systems when similar areas were present.

For Prodigy, the hypothesis was not supported; for the CompuServe system, it was supported with more than half (59%) of all messages. The CompuServe system, then, was composed mostly of messages about business and/or computer usage, while the Prodigy system was more mixed with other areas.

Prodigy users, for whom almost one-fourth of the messages come from the Computer "Club," have found other areas of interest while browsing through club areas. The Arts Club was slightly more active than Computer, but was closely followed by the Home Life board. These three account for almost three fourths of the message total.

This gives further credence to the broader scope of the Prodigy audience, who have greater interests in more diverse topics. The board balance also supports family preeminence of the system.

For CompuServe, the strong preferences show in stronger terms that the typical user is really computer-oriented in interests. Even though other board areas are available, computer boards are three times as popular, collectively, as the next largest forum area of hobby/lifestyle/health.

It was also hypothesized that the business/professional boards would be more popular on CompuServe than general interest boards. This hypothesis was supported by data showing almost a two-to-one ratio favoring business/professional board use. This further strengthens the view that more CompuServe members are task oriented with fewer hobby or entertainment ambitions.

A similar hypothesis proposed that CompuServe users would be more business/professional oriented (for board use) than their Prodigy counterparts. The hypothesis was moot since no such boards are a part of the Prodigy system.

Interestingly, these trends may be vastly different as needs change and as users "discover" the potential of other boards. From undocumented personal experience, it appears the CompuServe computer boards may be contributing a lower percentage of total board usage, with time, as compared to the newer special interest areas within the service.

And the marketplace will go to a specific area that best fit its needs. Armed with knowledge about the capabilities of competing services (and forums/clubs within a service), bulletin board users can now choose which system best fits their needs. As in the early television days when viewers had little choice, the early board enthusiast had little selection of board styles or preferences. With competition from similar services such as America Online and GEnie (and more that will follow as the market increases in size) each service will draw users that favor certain types of use.

These results indicate persons may be seeking a move away from mass communication toward media with more interpersonal qualities. The study points to Wiebe's (1959) proposal of a V-shaped continuum for comparing mass, interpersonal and intrapersonal communication. As discussed in the literature review, the conclusion drawn with this model is that moving from the closed (intrapersonal) end through interpersonal to the open (mass) end of the "V," the message becomes less personal, less specialized, and more general. Clearly, with the hierarchical nature and extremely specialized nature of the boards, mass communication is not what is desired.

Bulletin Boards as a Family Activity. The computer has traditionally been observed as a complex tool operated by an expert. Yet, the Prodigy service advertises itself as a "family" service with special areas for children, clubs for women and teens, and rules that govern undesirable behavior.

To answer this research question, the respondents were asked which other family members chose to participate in bulletin board activities. Of those who live with other persons, almost two-thirds of the Prodigy sample cited use by other family members, while about one in five CompuServe members stated activity by other family members.

The response is due partly to promotion, surely, but also because of relative ease of use (Schwartz, 1991), lower cost, and range of other services offered. Prodigy is simple and easy to operate, understand, and navigate. It is graphics-based with colorful pictures, offers hundreds of additional services and does not charge by the hour. For some, the safety net of protection from offensive/abusive views of others is important. A Prodigy parent, it would seem, would encourage children to use the service.

CompuServe is fast paced, business-like, and has experts available in almost any area. The attitudes of the users seem more serious and more intent. The text-based graphics are extremely fast and accessible by specialized software. Even with by-the-minute rates, costs can be low for experienced users. Unlike Prodigy, computer programs can be downloaded, but with a time/cost premium. Protocols, buffer types and X/Y downloads are familiar terms to its users. There are no delays due to gatekeepers, no rejection of offensive postings, no frills of graphics. It is a service that can offer tremendous information advantages. However, a parent with reservations about cost or objectionable material might be leery of allowing young children to browse without supervision. These data lend support to the literature review of Vendetto (1989), categorizing Prodigy as strong in family background, while characterizing CompuServe as business-oriented.

Usage Patterns. Many of the following suggestions were called into question by Blackman (1990, p. 264) who encouraged interviews and survey methods to find out more about on-line behavior and messaging activities. The results indicate most board users are daily users, with little difference shown between the services for activity of use. The typical pattern appears to be evening use, especially late at night.

The hours-of-use data was bimodal, with CompuServe users favoring a relatively low hours per week mode of one, compared to five for Prodigy. The messaging rate difference between the two services is insignificant, with the total sample averaging about 18 postings per week.

Bulletin board activity is a frequent ritual that is used primarily for keeping up with what is happening in a particular interest area. Two or three messages are sent per day, on the average, but the amount read is indeterminable. Presumably, users with special needs will read all within that category since the region was last visited. Both Prodigy and CompuServe provide mechanisms to make this easier.

"It's addictive. I spend more & more time online! I find I like it better than working or doing anything around the house. Most impact on doing household stuff. Also find that I communicate more knowledgeably about computers and investments. A lot of people think I really am an expert!! Much of what I know about computers/applications comes from cis. If everyone spent as much time as I do reading all this stuff they'd be experts too."

--CompuServe Respondent

"Where else could I visit with people, all over the U.S., at any time of the day or night?"

--Prodigy Respondent

These data lend support to literature reviews (Edighoffer, 1986; Garramone, 1986; Mihalo, 1985) which indicate bulletin boards have become a way of life, a daily routine.

The bimodal data for hours of use can be explained by cost, and by software (for CompuServe) that quickly retrieves information of interest. Because time is at a premium, experienced users typically do not browse, or read the messages while online. Thousands of words can be captured quickly with specialized software (such as TAPCIS and Navigator) within minutes, captured into a text file, and read when convenience permits. Though most are daily users, the time per session is often only a few minutes.

Additionally, software-aided CompuServe users can take advantage of the asynchronous nature more fully than browsers. The literature review pointed to the ability to change synchronous messages to asynchronous, thus enabling "time-shifting." (Potter, Forrest, Sapolsky, & Ware, 1988).

Multi-Service Users. The final research question asked about the willingness to use other systems. Most users indicated that they are not dedicated solely to one service. The total sample was

again bimodal, with CompuServe users more willing to experiment with other services than Prodigy users. CompuServe users were two times more likely to also be Prodigy users than the reverse.

These multi-service results may be due to the major difference that characterizes the Prodigy system. As discussed in the literature review, it is the only one that uses the NAPLPS (graphics based) system, with drawings, color, and sound. Though other software uses some graphics in menu selections on the user's computer, graphics are not sent online. These users, some of which may be more "computer-phobic," may be more leery of computeresque systems. Future systems may allow a combination of graphics capture with speed of access, which, until now, is a drawback with the NAPLPS system (Flanagan, 1990; Rothfeder, et al., 1990).

Strengths and limitations

Counted as a strength is the online data collection method. New technologies may be excellent vehicles for instruments in the future because of their fast access, reliable, verifiable delivery, and ease of feedback. Problems learned and experience gained should be helpful to other researchers with this method.

There are new sets of terms with any medium. In this case bulletin boards were confused by CompuServe (not Prodigy) users with any activities within a forum, which includes library download services and real time communication activities. Fortunately, this misunderstanding was noticed in the first, and not the final, sample.

Similarly, traditional terms take on new meaning when delivered electronically. Mail could mean posted or electronic; public communication could mean large group deliveries (face-to-face) or posting a message to a bulletin board audience; "talking" may indicate writing through the boards to an acquaintance. Indeed, even between services, the terminology is different, but may be diffusing. It is very important to be explicit and specific about the terms that are used relating to the new media.

It was previously cited that Blackman (1990) discovered only 9% of those who are bulletin board users actually post messages. This gives a high percentage of the bulletin board audience as "lurkers" only. Since this sample was based on selecting from only messages received (therefore, not including lurkers), the data could be skewed. For the procedures used in this study, it was assumed that the characteristics for each group (senders and lurkers) are similar. This assumption is open to further study.

Suggestions for Future Online Surveys

The survey was performed through a method very familiar to all of the users -- electronic mail. This is considered a strength because it provides new guidance for future researchers who wish to deliver digital material in this fashion. It is fast, relatively inexpensive, and allows users to request feedback that can clarify misunderstandings about the instrument. However, it does have some limitations.

First, the system through which it is delivered may have some objections to its use. "Junk mail" is frowned upon by all, especially the gatekeepers who are able to reject messages. Though researchers would hardly think of their important instruments as junk, many might interpret them as such. And though this study did not do so, it might be valuable to receive prior approval, rather than risk message rejection while in the middle of the data gathering stage.

This author did receive such a notice from Prodigy, stating that another member had complained about violations of Section 8 (previously cited) of the member agreement. The message stated that another complaint would be cause for membership rejection. Though the instrument does not violate the wording of the agreement, and was delivered by "private" electronic mail, the sole determination of such a decision comes from Prodigy. There would be little recourse if one's service was terminated due to misinterpretation of the rules.

As with any mail survey, shorter electronically-delivered surveys will be more likely returned than long ones. The rate of return was enhanced with a simple letter of study explanation, seeking approval to send a survey. The initial answer (to fill out, or not to fill out the survey) should be made simple and easy to perform by sending just a keystroke for an answer. The total number of messages sent increases, but the return rate will also go up in the process.

Be truthful in an initial request for help. If the survey is several pages long, do not tell them it will only take five minutes to fill out. But also let them know that their quick response is needed.

Take advantage of the quick feedback procedure. Encourage respondents to ask questions and get clarification on items. And, by all means, respond rapidly to any message by signing on several times a day to check the mail.

As a matter of personal preference, this author would not re-visit those who responded with a negative answer to the survey request. But continue to send notices to non-respondents who initially said they would participate.

As previously mentioned, CompuServe is international in scope, and users frequently are undetectable as to national origin, in addition to age, sex and other personal characteristics. This study was careful to exclude members when comparisons were made to the U.S. population. However, it is possible that some could be included. The safest course would be to ask the respondent for these data.

Consider also the length requirements of electronic messages. Prodigy limits messages to a relatively short instrument. If the survey is longer, it is wise to consider a different method.

Suggestions for Future Study

The characteristics of the bulletin boards and their users should be reassessed over the years to determine trends. Rogers (1986) found that the characteristics of early adopters of a new technology may be vastly different than those found in the "take-off" stage or those considered to be later adopters. Done in the early "take-off" stage, a study of bulletin board users would be instrumental to observe trends in use over time. Of course, further study is encouraged to replicate any portion of this study.

Similarly, quantitative studies should be a followup to this exploratory study. By increasing the sample size, the populations could be more adequately described. With the divisions of uses derived, categories for the respondents to consider as important could be presented on a numerical scale. Interval data could be collected that provides more information about this medium.

Certain theory could be tested and advanced, and further explaining bulletin board use. One such theory that would be readily useful is the uses and gratifications approach, which is functional in looking to which needs are sought and gratified by a medium. This theory has shown great utility in the measurement of such factors as presented in this study.

Some communications theorists have found that communication apprehension becomes a factor in most interpersonal situations. From some responses in these sample, it appears that a new person emerges in this medium that is free from the constraints normally attributed to communication apprehension.

Of special concern for study is the "lurking" population of bulletin board users. If Blackman's (1990) suppositions are true, the population captured in this study is more correctly specified as bulletin board messagers, rather than bulletin board users. A research design needs to be devised to check the population of board lurkers, as compared to those who message as well. Do they share the same characteristics as those found in this study? Is there a similar reduction in other media activities? Do they share the same patterns of use found in this study?

With some of the conclusions found in this and other studies, it appears several special groups of persons may be potential experimental groups. Those with characteristics of very active board users may have very special and different ways of communicating. The old, the deaf, the physically handicapped, those with critical special needs (e.g. participants on the Cancer, AIDS, and Diabetes forums on CompuServe) should be good candidates for such a study.

For any group, further study needs to be performed looking deeper into the interpersonal crossovers between face-to-face communication and bulletin board "talking." What similarities and differences exist? What conventions, etiquette, and habits are characteristic?

As a new communication medium, electronic bulletin board fulfills many expectations of both mass and interpersonal communication. Though media is difficult to assess for future benefit, it appears electronic bulletin boards will continue its growth and spread to an even wider segment of the population than is characteristically present today. The lines that once were so sharp to delineate disciplines may blend together, with the aid of interactive, computer-aided devices.

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